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Mattress and Bedding Fires in Residential Structures

FINDINGS

- Each year, an estimated 20,800 fires are attributed to mattress/bedding fires. These fires cause 2,200 injuries, 380 fatalities, and \$104 million in property loss.
- Injuries and deaths from mattress/bedding fires are more than twice those from all residential structure fires.
- Children playing and smoking are the leading causes of mattress/bedding fires, each at 25%.
- Cigarettes are the leading form of ignition (26%) in mattress/bedding fires, but lighters and matches combined account for 31%. Most (83%) of these fires start in the bedroom.
- More than two-thirds of injuries in mattress/bedding fires occur to persons attempting fire control. Fatalities most often occur (43%) to persons who are sleeping.
- Smoke alarms either were not present or did not operate in 62% of mattress/bedding fires.

Sources: NFPA & NFIRS

Mattresses manufactured today are much safer than they once were. In 1973, the U.S. Consumer Product Safety Commission (CPSC) enacted the Federal Mattress Flammability Standard, which required mattresses to resist ignition from smoldering cigarettes and other small flames. This standard, along with public education and strict industry compliance, has been credited by the Sleep Products Safety Council with reducing the number of mattress fires and mattress-related fire fatalities.¹ Today, the CPSC is developing a new standard that will require mattresses to be resistant from ignition not only by cigarettes but also open flame sources such as candles, matches, and lighters.²

Despite the legislation and other prevention messages, mattresses and bedding materials are involved

in many fires.³ Between 1996 and 1998, there were an estimated 20,800 residential structure fires where mattresses, pillows, and bedding materials were reported as the item first ignited. These fires were responsible for more than 2,200 civilian injuries, 380 civilian fatalities, and almost \$104 million in property loss.⁴

As shown in Figure 1, the human toll per fire in residential structures from mattress and bedding fires is greater than for all fires in residential structures. Casualties per fire from mattress and bedding fires are more than double the average from all fires in residential structures. Dollar loss per fire is also higher than the average per residential structure fire.

This report examines the causes and characteristics of mattress and bedding fires.

CAUSES

The leading causes of mattress and bedding fires are shown in Figure 2. Children playing and smoking each cause 25%, arson accounts for 16%, and electrical and open flame each cause 9%. By contrast, the leading cause of residential structure fires overall is cooking followed by heating.

FORM OF HEAT OF IGNITION

Figure 3 shows the four leading forms of heat that ignite mattress and bedding fires. Cigarettes, associated almost exclusively with smoking fires, were the leading form of heat in 26% of mattress and bedding fires. Lighters and matches were second and third, with 16% and 15%, respectively. Candles ignited 6% of mattress and bedding fires. Although smoking in bed is commonly associated with mattress and bedding fires, more fires are caused by sources of open flame than by cigarettes.

AREA OF FIRE ORIGIN

Not surprisingly, 83% of residential mattress and bedding fires occur in a bedroom. The remainder of these fires start elsewhere, including lounges, kitchens, crawl spaces, and garages. Many homeowners store mattresses in these "other" rooms when they are not in use. To prevent unnecessary fire hazards, mattress manufacturers recommend discarding mattresses if they are not used for a prolonged period of time rather than placing them in storage.⁵

LOCATION OF CIVILIAN CASUALTIES

Figure 4 shows significant differences in the location at time of civilian injuries and deaths in mattress and bedding fires. Nearly three-quarters of the civilian

Figure 1. Loss Measures for Residential Structure and Mattress/Bedding Fires

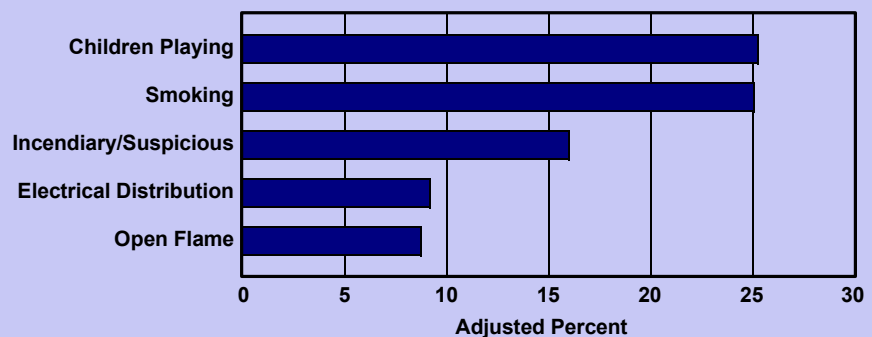
(3-year average, NFIRS data 1996–98)

LOSS MEASURE	RESIDENTIAL STRUCTURE FIRES	MATTRESS/ BEDDING FIRES
Dollar Loss/Fire	\$11,271	\$12,548
Injuries/1,000 Fires	48.0	113.5
Fatalities/1,000 Fires	7.7	16.1

Source: NFIRS only

Figure 2. Leading Causes of Mattress/Bedding Fires

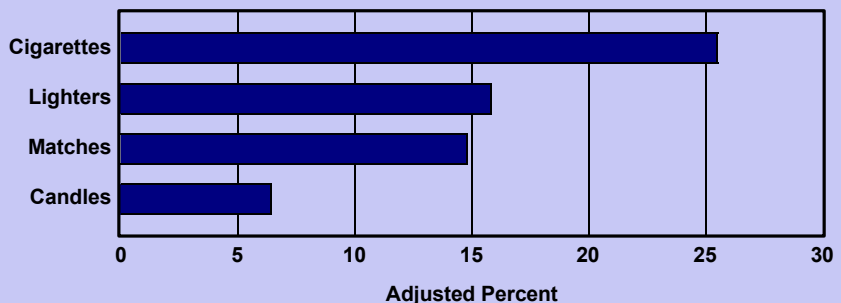
(residential structure fires, 3-year average, NFIRS data 1996–98)



Source: NFIRS only

Figure 3. Leading Forms of Heat Igniting Mattress/Bedding Fires

(residential structure fires, 3-year average, NFIRS data 1996–98)



Source: NFIRS only

Figure 4. Leading Locations of Civilians Injured and Killed in Mattress/Bedding Fires

(residential structure fires, 3-year average, NFIRS data 1996–98, adjusted percentage)

LOCATION AT TIME OF INJURY	PERCENT OF INJURIES	PERCENT OF DEATHS
Intimately Involved With Item Ignited	17.2	10.9
In Room of Origin	35.8	17.2
Same Floor	24.6	48.4
Same Building	14.9	21.9

Source: NFIRS only

injuries occurred while the victim was intimately involved with the ignition, in the room of origin, or on the same floor of fire origin. These individuals were most frequently attempting fire control activities. Forty-two percent of the civilians killed in mattress and bedding fires were asleep at the time of fire ignition. Those individuals in the same building and about one-quarter of those on the same floor of origin were injured while escaping from the fire.

ACTIVITIES OF CIVILIAN CASUALTIES

Figure 5 shows the leading activities for civilian injuries and deaths in mattress and bedding fires. A significant number of injuries were attributed to attempting to control the fire (68%). Civilian deaths occurred most frequently while the individual was sleeping. Thirty percent of victims died while attempting to escape. One out of every seven people killed in mattress and bedding fires were

attempting to control the fire at the time of death.

SMOKE ALARM PERFORMANCE

Figure 6 shows smoke alarm performance in mattress and bedding fires. Smoke alarms were not present in 42% of the residences where mattress and bedding fires occurred. Smoke alarms operated in just over one-third of mattress and bedding fires, but they did not activate in 20% of them. In only a few cases was the fire too small to activate the smoke alarm.

Figure 5. Leading Activities of Civilian Casualties in Mattress/Bedding Fires

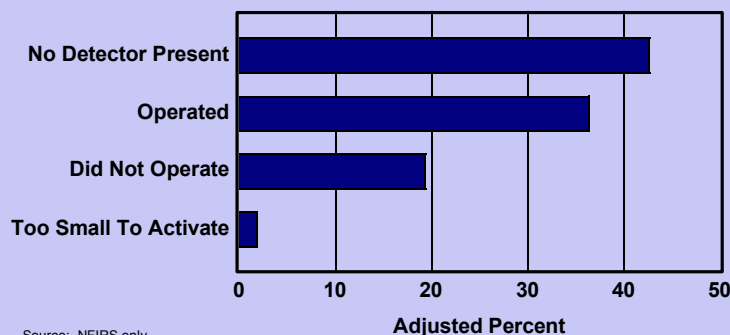
(residential structure fires, 3-year average, NFIRS data 1996–98, adjusted percentage)

LOCATION	PERCENT OF INJURIES	PERCENT OF DEATHS
Escaping	10.4	29.5
Sleeping	11.1	43.2
Fire Control	68.2	13.6

Source: NFIRS only

Figure 6. Smoke Alarm Performance in Mattress/Bedding Fires

(residential structure fires, 3-year average, NFIRS data 1996–98)



Source: NFIRS only

EXAMPLES

- On March 10, 2000, two children aged 3 years old and 19 months old were killed in an Indiana house fire that started in a mattress in a living room. Investigators believe the 3-year-old was playing with a cigarette lighter when he set fire to the mattress. The two boys were trapped as fire raced through the house. A 15-year-old babysitter tried unsuccessfully to rescue the youngsters but was driven back by intense heat and flames and escaped from the house through a window. The battery in the smoke alarm had been removed earlier in the week after it had activated during a small kitchen fire.⁶
- On September 26, 2001, a fire in a three-story apartment building

critically injured 2 people and sent 12 others to Miami area hospitals. The fire started in a mattress that was propped up against an electrical plug that started sparking, setting fire to the mattress. The tenant who was sleeping on the bed at the time attempted to remove the mattress from his third-floor apartment. He tried pushing the mattress down the stairs, but it got stuck, spreading flames throughout the building. Smoke and flames trapped several residents, forcing some to escape by jumping from their windows.⁷

- On May 4, 2001, an improperly discarded cigarette smoldered on a bed for nearly 9 hours before reigniting. The resulting smoke and fire damage to a Santa Rosa, California, bungalow exceeded \$100,000. The fire injured a fire

department captain, two residents of the house, and killed two dogs. No working smoke detectors were installed in the home at the time of the fire.⁸

CONCLUSIONS

Children playing and smoking cause half of all mattress and bedding fires. Both causes are preventable. Having a working and properly placed smoke alarm is especially important in reducing mattress and bedding fires. These fires often smolder for a while. A working smoke alarm would alert a majority of those who are asleep while the fire smolders, thereby saving numerous lives. Also, civilian injuries would decrease significantly if fire control activities were left to the fire department.

For further information on mattress and bedding fires, contact your local fire department or the USFA.

To review the detailed methodology used in this analysis, click **METHODOLOGY**

Notes:

1. The Sleep Products Safety Council (<http://www.safesleep.org>).
2. "Standard To Address Open Flame Ignition of Mattresses/Bedding; Advance Notice of Proposed Rulemaking," *The Federal Register*, Vol. 66, No. 197, October 11, 2001.
3. Mattress and bedding materials include mattresses, pillows, blankets, bed sheets, comforters, heating pads, etc., and are in one combined category in NFIRS 4.1.
4. National estimates are based on data from the National Fire Incident Reporting System (NFIRS) (1996-1998) and the National Fire Protection Association's (NFPA's) annual survey, *Fire Loss in the United States*.
5. The Sleep Products Safety Council, op. cit.
6. Morr, Bill and John Huston, "Brothers Die in Fire, Sitter Escapes: Mattress Set Afire With Lighter," *The South Bend Tribune*, March 11, 2000.
7. Hernandez, Jaime, "Fire Breaks Out at Rooming House; 12 People Hospitalized," *The Associated Press*, September 27, 2001.
8. "California Fire Injures Captain," *Firehouse.com*, May 4, 2001 (<http://www.firehouse.com/>)